REMARKS

Claims 1-3 are presently pending in the application.

Claims 1 and 2 have been amended to recite that component (B) is selected from the group consisting of phosphite, thiophosphite, and ammonium or amine salts thereof, and that component (C) comprises a non-dispersion type polymethacrylate. Support for these amendments may be found in the specification at least at page 10, lines 4-10; page 13, lines 18-26; page 14, last 3 lines; and page 20, lines 3-5. Claims 1 and 2 have also been amended to recite that the sulfur-containing component may not be a molybdenum dithiocarbamate compound and may be a non-molybdenum-containing dithiocarbamate compound. Support for this amendment may be found in the specification at least as follows. The specification teaches that the sulfur-containing component may be "thiazole compounds, thiadizole compounds, dithiocarbamate compounds, molybdenum dithiocarbamate compounds, dihydrocarbylpolysulfide compounds..." (page 22, lines 4-10). A distinction is clearly made between "dithiocarbamate compounds" and "molybdenum dithiocarbamate compounds," implying that the former refers to "non-molybdenum-containing dithiocarbamate compounds" or the language would be repetitive and redundant. Further, one skilled in the art would clearly understand that dithiocarbamate compounds and molybdenum dithiocarbamate compounds are functionally distinguished from one another. Dithiocarbamate compounds have a separate recognition in the art as a class of compounds that are generally known to be ashless additives and not friction modifiers. Molybdenum dithiocarbamates are generally included in classes of compounds such as "molybdenum-containing compounds" and "organic molybdenum compounds," and would not be understood by those skilled in the art to be encompassed by "dithiocarbamate compounds." No new matter has been added by these amendments, and entry is respectfully requested.

In the Office Action, the Examiner has formally rejected the claims under 35 U.S.C. § 112, first paragraph, as lacking support in the application. The Examiner appears to be arguing that the claims recite that the composition comprises a sulfur containing compound selected from the group consisting of thiazoles, thiadiazoles, etc. and an alkaline earth metal sulfonate, but that the specification does not recite both a sulfur containing compound selected from thiazoles, etc.

and an alkaline earth metal sulfonate. Applicants respectfully traverse this rejection as follows. The specification teaches (pages 22-23) that additives may be included in the composition, including thiazoles as corrosion inhibitors and metallic detergents, such as calcium sulfonates, and that these additives may be used singly or in combination (page 23, lines 2-3, emphasis added). Also, the compositions in Examples 1-6 contain both a thiadiazole-based corrosion inhibitor and calcium sulfonate as a Ca-based detergent. Accordingly, claims 1-3 are indeed supported in the specification, and reconsideration and withdrawal of the §112 rejection are respectfully requested.

The Examiner has rejected claims 1-3 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,583,092 of Carrick et al. ("Carrick") in view of U.S. Patent Application Publication No. 2001/0044389 of Komiya et al. ("Komiya") and U.S. Patent No. 4,169,799 of Sung et al. ("Sung"). The Examiner maintains that Carrick discloses a lubricating oil composition comprising base oil, specifically mineral oil of the paraffinic and naphthenic type, and specific amounts of phosphorus and sulfur which allegedly overlap the claimed amounts. The Examiner contends that Carrick specifically teaches that the saligenin derivative salts provide a partial replacement for sulfonate detergents, and that there is thus some sulfonate present in the Carrick composition. Carrick allegedly also teaches that the sulfonate detergent is present in an amount of 0.01% by weight of the lubricating composition.

Carrick allegedly also discloses viscosity index improvers, including polymethacrylates, and a kinematic viscosity of the composition of 5 to 16.3 mm^2/s at 100° C. The Examiner acknowledges that Carrick does not teach the kinematic viscosity and %Cp of the mineral oil or the sulfonate detergent as an alkaline earth metal sulfonate. However, the Examiner argues that in view of the teaching of Carrick of the kinematic viscosity of the final composition and the fact that the composition comprises mineral oil and a viscosity index improver up to 10 wt%, a sufficient amount of viscosity index improver was added to the mineral oil to raise it to 5 mm^2/s at 100° C from the initial viscosity. Therefore, the Examiner concludes that it would have been obvious to one having ordinary skill in the art at the time of the invention for the initial kinematic viscosity of the mineral oil to also overlap that of the present claims.

The Examiner further maintains that Komiya discloses a lubricating composition containing mineral oils, such as paraffinic and naphthenic mineral oils which have a kinematic

viscosity of 1 to 4 mm^2/s, which allegedly overlaps the claimed viscosity. Komiya allegedly also discloses the %Cp of the oil at 70 or higher. Therefore, the Examiner takes the position that the transmission oils disclosed by Carrick and Komiya contain similar mineral oils and would thus display the same characteristics. The Examiner concludes that it would have been obvious for the transmission oil composition disclosed by Carrick to comprise a base mineral oil having a %Cp from 75-81, as taught by Komiya, for enhancing low temperature fluidity.

Finally, the Examiner cites Sung as teaching that alkaline earth metal sulfonates are well known in the art as sulfonate detergents for use in lubricating compositions. Accordingly, the Examiner concludes that it would have been obvious to utilize an alkaline earth metal sulfonate as the sulfonate detergent in the Carrick composition. Applicants respectfully traverse this rejection for the reasons set forth previously on the record, which Applicants rely upon in full, and for the additional reasons which follow, and respectfully request reconsideration and withdrawal of the rejection.

As previously explained on the record, the purpose of the presently claimed invention is to provide low viscosity transmission lubricating oil compositions which can enhance fuel efficiency and improve the durability of gears and the shifting properties of wet clutches, including long-lasting shifting properties. Applicants have developed the presently claimed compositions with a low viscosity of 5.0 to 6.0 mm^2/s at 100° C and a sulfur content of not more than 0.15 % by mass of the composition or of 0.05 to 0.14 %. These compositions are obtained by adding appropriate amounts of (B) a specific phosphorus compound in an amount of 0.025 to 0.05 mass % or 0.03 to 0.035 % as P, (C) a viscosity index improver comprising a non-dispersion type polymethacrylate (PMA) having a number average molecular weight of from 5,000 to 35,000, (D) a sulfur-containing compound which is at least one compound selected from the group consisting of thiazole compounds, thiadiazole compounds, non-molybdenum-containing dithiocarbamate compounds, dihydrocarbylpolysulfide compounds and sulfurized ester compounds, as well as an alkaline earth metal sulfonate, to (A) a specific mineral lubricating base oil having a kinematic viscosity of 2.3 to 3.4 mm^2/s or of 2.5 to 3.3 mm^2/s at 100°C and a %Cp of not less than 70 or of 73 to 82. The resulting low viscosity compositions are highly fuel efficient and capable of improving the durability of gears and the shifting properties of wet clutches.

Carrick teaches a lubricating oil composition for engines, such as gasoline powered engines and diesel engines, particularly heavy duty diesel engines. The oils are taught to have a reduced sulfur level relative to prior art oil compositions and to provide "enhanced high temperature deposit performance, oxidative inhibition, improved seal compatibility, and lead and copper corrosion resistance characteristics" (col. 4, lines 25-34). The Examiner appears to have disregarded the fact that lubricating oils for engines are completely different from lubricating oils for transmissions. Transmission oils (fluids) are hydraulic fluids that are specially manufactured for transmissions, and are used by the steering system to keep the parts moving smoothly. In contrast, engine oils (motor oils) are lubricants. While transmission fluids do have some lubricating properties, they are not sufficient to sustain an engine. Motor oil is an excellent lubricant, but not such a good hydraulic fluid such that it cannot be used in a transmission.

There are other significant difference between the two types of oils. For example, engines are designed to deal with the products of combustion, whereas automatic transmission fluids (ATF) do not see contaminants from fuel burning and are not exposed to the same high temperatures as are engine oils. An ATF is basically a closed system and the lubricant must last for a long period of time. An engine oil must be drained to remove the contaminants after a relatively short time or mileage relative to an ATF. Accordingly, the compositions of lubricating oils for transmissions and for engines are different and Carrick's teaching of a lubricating oil for engines would not teach or suggest the claimed lubricating oil compositions for transmissions.

The composition of Carrick contains: (A) a base oil, (B) an alkali or alkaline earth metal salt of a saligenin derivative, (C) an alkali or alkaline earth metal salt of a hydrocarbon-substituted salicylic acid, and (D) a metal salt of a phosphorus-containing compound. The composition of Carrick preferably also includes (E) an acylated nitrogen-containing compound, (F) a boron-containing compound, and (G) a dispersant viscosity index modifier. Optional additives may be included, such as corrosion-inhibiting agents, antioxidants, viscosity modifiers, pour point depressants, etc. (col. 24, lines 63-67). Several of the claimed components are not taught or suggested by Carrick.

For example, Carrick teaches a metal salt of a phosphorus-containing compound represented by Formula (D-1) as an extreme pressure and/or antiwear additive, in which X1, X2,

X3, and X4 are independently O or S; a and b are independently 0 or 1, and R1 and R2 are independently hydrocarbyl groups (col. 13, lines 15-35). This Component (D) of Carrick is a phosphate metal salt and is completely different from claimed component (B), which is a phosphite, thiophosphite, and/or an ammonium or amine salt thereof. Carrick also does not teach or suggest the use of the claimed sulfur-containing compound (D): a thiazole, thiadiazole, non-molybdenum-containing dithiocarbamate, dihydrocarbyl polysulfide compound, or a sulfurized ester compound.

Additionally, Carrick teaches the use of (G) dispersant viscosity index modifiers in which dispersancy functionality is introduced by post reacting a viscosity index modifier to introduce polar groups (col. 22, line 50 to col. 23, line 53). However, Carrick does not teach or suggest a non-dispersion type polymethacrylate as claimed. Therefore, Carrick does not teach at least claimed components (B), (C), and (D).

Further, there would have been no motivation to combine Carrick with Komiya and/or Sung, as suggested by the Examiner. As noted above, Carrick relates to a lubricating oil composition for engines. Komiya teaches lubricant compositions for transmissions, particularly automatic transmissions and continuously variable transmissions, and are designed to maintain anti-shudder properties even after prolonged use. Sung teaches a lubricating oil designed for railroad diesel engines. Since, as previously explained, engine oils and transmission oils have different properties and are subjected to different conditions, there would have been no motivation to combine these references. That is, one skilled in the art would not have been motivated to utilize a component found in the transmission oil of Komiya, for example, in the engine oil of Carrick, and there would have been no reasonable expectation of success in such a modification or combination. One skilled in the art would clearly understand that the physical properties and specific components of lubricating oil compositions are critical for providing such oils with the attributes required for the particular application, and adding a component to one type of oil may render it unfit for its intended use. Finally, even modification of the Carrick oil to include components taught by Komiya and Sung would still result in a lubricating oil composition for engines, not for transmissions, as claimed.

For at least these reasons, reconsideration and withdrawal of the § 103(a) rejection based on Carrick in view of Komiya and Sung are respectfully requested.

In view of the preceding Amendment and Remarks, it is respectfully submitted that the pending claims are patentably distinct from the prior art of record and in condition for allowance. A Notice of Allowance is respectfully requested.

Respectfully submitted,

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